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September 30, 1994

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 200054

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In re: **Ex Parte Presentation in Gen. Docket No. 90-314 (Amendment of the Commission's Rules to Establish New Personal Communications Services)**

Dear Mr. Caton:

This afternoon, Ross Ruthenberg, Member of the Technical Staff of Motorola, and I met with Messrs. Knapp, Inglis and Mr. Reed of the Office of Engineering and Technology to address emissions measurement issues associated with the equipment authorization of licensed PCS. Copies of the materials used in our discussions are attached hereto.

Should any question arise concerning this matter, please contact me.

Respectfully,

David E. Hilliard

David E. Hilliard
Counsel for Motorola, Inc.

cc: Messrs. Knapp, Reed, and Inglis

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ERP

MOTOROLA ASKS THE COMMISSION TO CLARIFY THE INTENT OF PARAGRAPH 200 OF THE MO&O THAT "P" IN 43+10LOG(P) REPRESENTS THE MEAN OUTPUT POWER OF THE TRANSMITTER, RATHER THAN THE POTENTIALLY INTERPRETED ERP OF THE SYSTEM.

- **AN ERP INTERPRETATION IS NOT CONSISTENT WITH PAST PRACTICES.**

- **MANUFACTURERS MUST DESIGN ALL TRANSMITTERS UNDER THE ASSUMPTION THAT THE LICENSEE MIGHT USE THE HIGHEST GAIN ANTENNA POSSIBLE.**

- **RESULTING 10-30DB PENALTY COMPARED TO 900MHZ CELLULAR WOULD SIGNIFICANTLY INCREASE COSTS, BATTERY DRAINS, and SPECTRUM INEFFICIENCIES DUE TO INCREASED BAND EDGE REQUIREMENTS.**

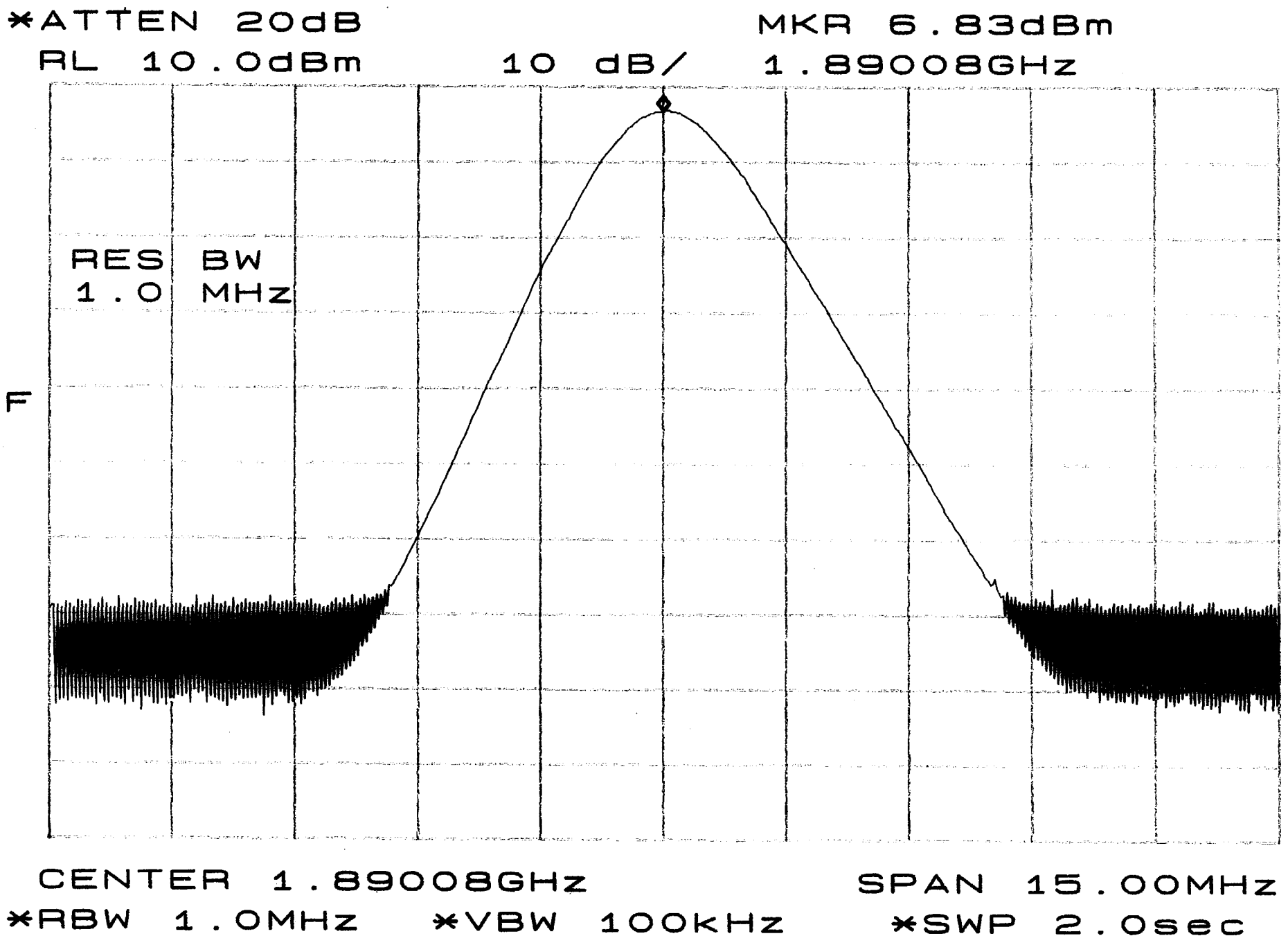
"RESOLUTION BANDWIDTH"

MOTOROLA RECOMMENDS ELIMINATION OF THE TERM "RESOLUTION BANDWIDTH" IN 24.238, USING INSTEAD "MEASUREMENT BANDWIDTH", WHERE THIS IS INTERPRETED TO INCLUDE A "BRICKWALL" FILTER EQUIVALENT (i.e. infinitely sharp filter skirt selectivity).

- **"RESOLUTION BANDWIDTH" CREATES THE INTERPRETATION THAT THE MEASUREMENT IS WITH SPECTRUM ANALYZER RESOLUTION BANDWIDTH SET TO 1 MHZ.**

- **1 MHZ SETTING HAS INSUFFICIENT FILTER SKIRT SELECTIVITY FOR "CLOSE IN" MEASUREMENTS...SIGNIFICANT DISTORTION OF THE RESULTS OCCUR DUE TO PICKUP OF ENERGY FROM OCCUPIED BANDWIDTH.**

- **"BRICKWALL" FILTER IS EASILY SIMULATED BY SETTING ANALYZER RESOLUTION BANDWIDTH TO APPROXIMATELY 1% OF THE MEASUREMENT BANDWIDTH AND INTEGRATING THE EMISSIONS POWER ACROSS THE MEASUREMENT BANDWIDTH**
  (i.e. the total emissions power in the measurement bandwidth).


*ATTEN 20dB
MKR 6.83dBm
RL 10.0dBm
10 dB/
1.89008GHz
RES BW
1.0 MHz
F
CENTER 1.89008GHz
SPAN 15.00MHz
*RBW 1.0MHz
*VBW 100kHz
*SWP 2.0sec

MEASUREMENT BANDWIDTH & DISPLACEMENT

•OBJECTIVE IS TO PROTECT THE PCS SERVICE IN THE ADJACENT LICENSEE FREQUENCY BLOCK i.e. the closest "adjacent channel".

•FURTHER OBJECTIVE FOR WIDE-BAND PCS IS "TECHNOLOGY NEUTRAL" REQUIREMENTS...MULTIPLE TECHNOLOGIES ENCOURAGED.

- •MULTIPLE ACCESS
- •MULTIPLE MODULATION TECHNIQUES
- •MULTIPLE BANDWIDTHS/CHANNELIZATIONS

•IN THIS KIND OF ENVIRONMENT, HOW WIDE IS THE "ADJACENT CHANNEL" AND WHERE IS IT?

•CURRENT RULE 24.238 ATTEMPTS A COMPROMISE IN DEFINING THIS AS 1 MHZ WIDE AND IMMEDIATELY ADJACENT TO THE LICENSEE FREQUENCY BLOCK BOUNDARY.

TOO CLOSE FOR THIS WIDTH.
TOO WIDE FOR THIS CLOSENESS.

•MOTOROLA RECOMMENDS A COMBINATION OF:

1) MAINTAINING THE COMMISSION'S REQUIREMENT OF 43+10LOG(P) EMISSIONS SUPPRESSION (i.e. constant emissions power of -43dBw).

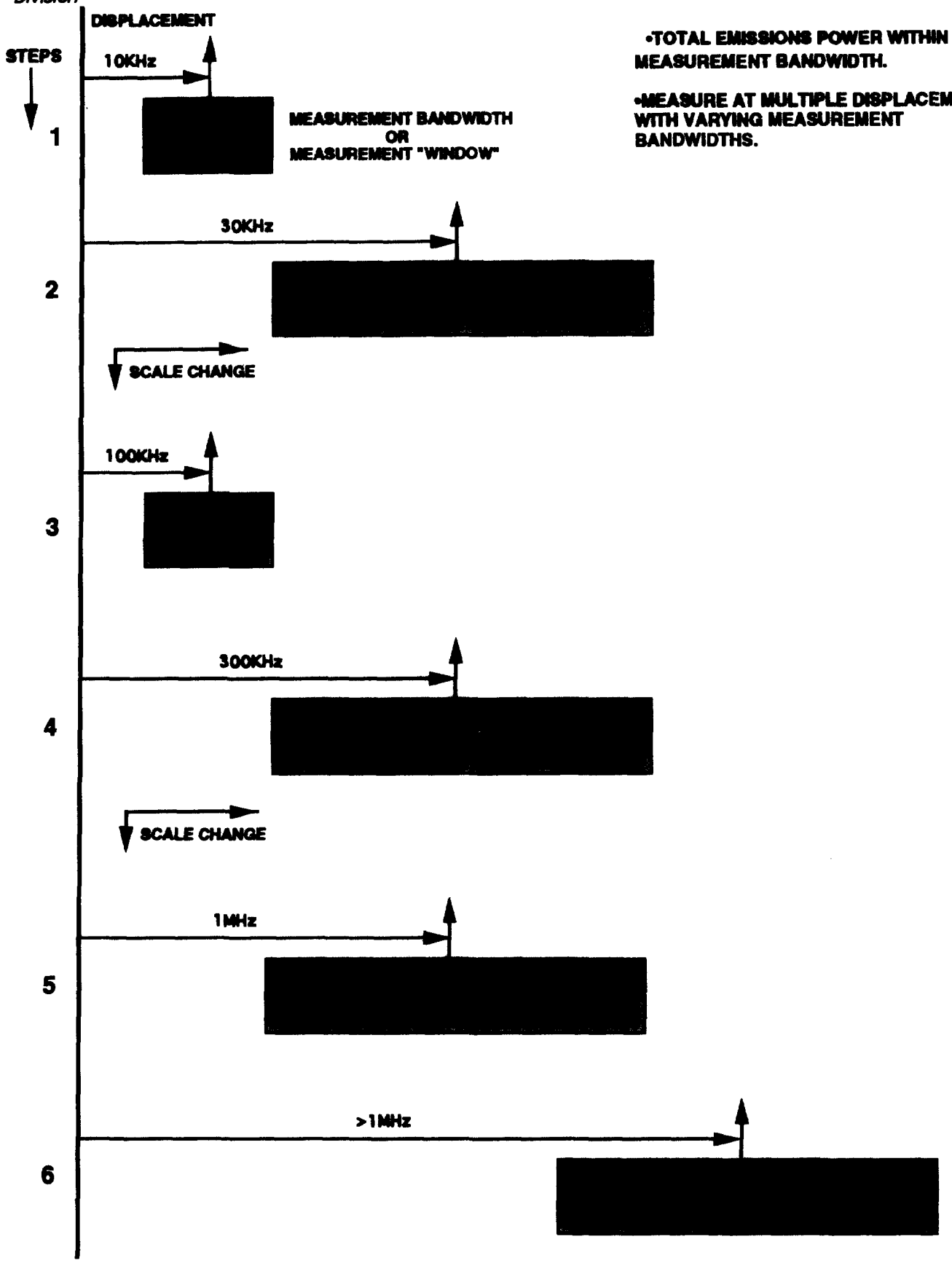
2) "BRICKWALL" FILTER APPROACH AS INDICATED.

3) A GRADUATED MEASUREMENT BANDWIDTH THAT APPROXIMATES THE "REAL WORLD" BY NARROWING AS IT APPROACHES THE LICENSEE FREQUENCY BOUNDARY.

•MEASUREMENT BANDWIDTH = DISPLACEMENT (from the licensee block).
(Up to 1 MHz maximum i.e. measurement bandwidth remains 1 MHz for measurements beyond 1 MHz displacement).

•THOUGH CONCEPTUALLY ALL POINTS OF DISPLACEMENT ARE MEASURED, MEASUREMENTS AT AT LEAST 10, 30, 100, 300 AND 1000 KHZ ARE SUFFICIENT FOR DISPLACEMENTS $\leq$ 1 MHZ.

Licensee
Block
Division

MEASUREMENT PROCEDURE

- TOTAL EMISSIONS POWER WITHIN THE MEASUREMENT BANDWIDTH.
- MEASURE AT MULTIPLE DISPLACEMENTS, WITH VARYING MEASUREMENT BANDWIDTHS.